KYLE PITSOR



October 14, 2005

Mr. Jim Holland
California Energy Commission
1516 Ninth Street, Mail Station 25
Sacramento, California 95814-5512

RE: NEMA Comments on Documents for Rulemaking 05-AAER-1; California Title 20
Proposed Amendments to Appliance Efficiency Regulations
15-Day Language dated September 30, 2005

Dear Mr. Holland:

The NEMA Lighting Division appreciates the opportunity to comment on the proposed regulations effecting lighting systems. NEMA recognizes and appreciates that the California Energy Commission has addressed many of our previously raised issues in this recent proposal. In particular NEMA generally supports the newly added definitions and the changes to the reporting format for lamps. Our detailed comments on the 15-day language are enclosed.

We would like to underscore a significant new issue with the 15-day language. This issue brings up a matter not previously discussed in the California regulatory development process, which is an apparently new requirement specifying how lamp manufacturers must collect and average test data for lamp efficacy of products not currently federally regulated in accordance with federal Department of Energy regulations, namely, general service incandescent lamps.

At no time was this discussed between the CEC and industry, a serious regulatory procedural flaw. The addition of what constitutes a new testing requirement into a definition is a serious standards process flaw. As a practical matter, the requirement is impossible to comply with as it would require time for manufacturers to implement such a requirement and 12 months worth of testing before January 1, 2006 for products not now tested according to this procedure. We are willing to discuss this matter as part of our Tier II interactions, but request that it be removed from the adopted Title 20 regulations.

Thank you for your serious consideration of these proposed changes. Please contact me regarding any questions or follow-up on our comments.

Very truly yours,

Kyle Pitsor

Enclosure

National Electrical
Manufacturers Association

# NEMA Lighting Division Comments on CEC Title 20 15-day Language dated September 30, 2005[1]

## I. Lamps

### Two Serious New Issues with 15-Day Language

NEMA would first like to address two critical issues with the current 15-day language. These are both new and did not exist in any previous versions of the standard.

### Issue One

On Page 65, (k) Lamps. The test method for federally regulated general service fluorescent lamps, state-regulated general service reflector lamps, and federally regulated incandescent reflector lamps is 10 CFR Section 430.23 **l** (2005).

The "L" in this citation is incorrect. The correct citation should be 10 CFR Section 430.23 **r** (2005).

In the previous 15 Day Language version the Test Method cited under Section 1604(k) was correctly cited as 10 CFR Section 430.23(r), which then leads within the Federal CFR to Appendix R, Sub Part B 10 CFR Section 430.23(r) of Part 430 (Uniform Test Method for Measuring Average Lamp Efficacy and CRI of Electric Lamps). Federal Appendix R then properly covers all three lamp types of concern, and correctly specifies the appropriate IESNA measurement standards for general service fluorescent , general service incandescent, and reflector incandescent lamps.

In the Sept 15 version of the 15 Day Language, 10 CFR Section 430.23(r) has somehow become 10 CFR Section 430.23l on page 65 which

- does not exist in Part 430.23
- is further not identified in the Language as an intended language change via strikeout or underline

So, we must conclude it is a clerical error and needs to be corrected by returning to the original correct citation of 10 CFR Section 430.23(r).

### Issue Two

On page 27, under (k) Lamps, the following newly updated definition appears:

[1] The lighting manufacturers and NEMA continue to believe and assert that the CEC's program as applied to products that Congress and the Department of Energy have elected to regulate under federal energy law is pre-empted by federal law, and nothing in our meetings or correspondence should be construed as a waiver of this assertion.

"Average lamp efficacy (LPW)" means the measured lamp efficacy of fluorescent lamps, general service incandescent lamps, or incandescent reflector lamps, expressed in lumens per watt, as determined using the applicable test method in Section 1604(k) ***and averaged as specified in 10 CFR Section 430.24 ( r ).***

The last citation to 10 CFL Section 430.24 ( r ) is incorrectly added to this definition. This citation is only applicable to Federally Regulated general service incandescent lamps and reflector incandescent lamps.

NEMA suggests that this last citation be removed or correctly re-cited as follows:

"Average lamp efficacy (LPW)" means the measured lamp efficacy of fluorescent lamps, general service incandescent lamps, or incandescent reflector lamps, expressed in lumens per watt, as determined using the applicable test method in Section 1604(k). **Federally regulated general service fluorescent and incandescent reflector lamps shall be averaged as specified in 10 CFR Section 430.24 ( r ).**

Section 430.24(r) also specifies the 12 month/minimum 21 lamp sampling plan manufacturers are required to implement r for federally-regulated general service fluorescent lamps and federally-regulated incandescent reflector lamps. However, manufacturers do not follow a 12-month/21 lamp-sampling plan to measure non-federally-regulated lamps such as general service Incandescent lamps. It would be impossible for any manufacturer to supply data based on this 12- month sampling plan for non-federally-regulated lamp by 1/1/2006. Nor is it agreed that this is even a necessary or appropriate sampling plan for non-federally-regulated lamps. At this late date, it is very inappropriate to propose this rigid and impossible to meet sampling plan for Tier 1 products that are state-regulated. State-regulated products should be reported based on existing company practices to collect and measure the required data.

## For Consideration

NEMA supports the new reporting format for Lamps and offers the following for consideration:

For consistency, the word 'Lumens' could be changed to 'Rated Lumens' as is stated for 'State Regulated GS Inc Lamps', and the word 'Nominal' in 'Nominal Wattage' could be changed to 'Rated' as is stated for 'State Regulated GS Inc Lamps'. Although NEMA manufacturers will treat 'Lumens' as 'Rated Lumens' and the term 'Nominal Wattage' as 'Rated Wattage' when reporting, it could minimize potential confusion for non-NEMA members if these simple editorial corrections were made since no fundamental meaning will result from these changes—only consistency and clarity.

## Non-Consensus Issues

The following NEMA comments address the areas where industry was not able to reach total consensus with the Commission's proposal.

**General Service Incandescent Lamps**

The proposed equation for Soft White lamps is an improvement over the original equation. The Soft White wattage allowance should always be greater than the wattage allowed for Clear and Frosted lamps. However, NEMA contends that an equation allowing a 3% higher wattage allowance for Soft White vs. Clear and Frosted is technically accurate from a lamp design perspective for the following reasons:

1. NEMA understands the physics of the coated bulb to be such that a fixed percentage of the light, which strikes it, will be absorbed. Our years of lamp development work show that this is true. The percent of the incoming light that is absorbed will depend on many factors, but our experience for incandescent lamps with A19 bulbs is that typical Soft White coatings will absorb about 3% of the light that strikes it. Of course, for clear bulbs, the amount absorbed is 0% since there is no coating. (Some of the light from the filament is reflected from each of the glass bulb's two surfaces, but this is the same for both soft white and clear lamps.)
2. In response to the CEC's original proposed Title 20 Soft White line, one of our companies has re-measured the lumen difference between otherwise identical Soft White and Clear lamps, over a wide wattage range. Not surprisingly, again the difference in luminous flux was found to be a consistent 3%.
3. If, as we believe, the difference is 3%, the "Soft White" and "Clear" lines certainly should not cross, and additionally they should not be parallel. Rather, they should diverge, as we indicated to the CEC in our Aug. 30 meeting with the CEC, as well as in our subsequent written comments. It will be obvious to any knowledgeable reader of the Title 20 standard that these parallel lines reflect a misunderstanding of the optical properties of the lamps. The fact that such lines should diverge is not altered by the feeling among CEC advisors that such lamp behavior "runs counter to their intuition".
4. The establishment of such lines from published, catalog data – as was apparently the case for the original CEC proposal – is fraught with uncertainty. As NEMA indicated to you in our Aug. 30 meeting, and again on the phone on Sept. 27, the 3% value cited above for the difference between Soft White and Clear lamps holds only for lamps that are otherwise identical. Taking lumen values from catalogs can hide lots of design and manufacturing differences, not to mention other differences that require a careful reading of the catalog: Is the bulb size and shape the same? Is the rated lamp life the same? Is the filament construction the same? Etc. Catalog data should not be used to generate such performance lines without being filtered through knowledgeable eyes.

Certainly as we try to work with the CEC as an industry partnership group to develop reasonable, technically sound standards that will really save energy, there will need to be give and take on both sides, and a spirit of compromise. However, on the technical details of lamp design and performance, the industry's voice should carry significant weight. We feel that if our proposed "3% line is rejected", we are owed a much better explanation than "it doesn't mesh with our intuition" or "we take catalog data as our base, even though much important information may be missing from the catalog." . While we would be happy to help with this, we note that there are other non-industry people who could do this.

## II. Metal Halide Luminaires

The NEMA Lighting Division appreciates the opportunity to further discuss the MH Luminaire standards to ensure that the Title 20 standard is feasible and effective in promoting energy efficiency. We would like to thank you for postponing standards for products with a horizontal lamp and removing the lamp/ballast efficiency and efficacy reporting requirements.

As indicated in the past, we endorse the use of pulse-start systems. However, there are significant concerns regarding outdoor lighting – specifically the availability of lamps for the necessary burning positions

Per the conference call on September 27, 2005 we are submitting the following proposal for revisions to address necessary revisions for outdoor lighting. These revisions have been reviewed and approved by the NEMA Luminaire, Ballast and Lamp Sections.

**Definition of "Exempted Outdoor Luminaire"**

Section 1602

**Editorial Option 1 – NEMA Preferred**

(n) Luminaires

**"Exempted Outdoor Luminaire" means a luminaire certified by the manufacturer to the Commission as meeting all of the following criteria:**

**~~(1)~~ Is rated for use in wet locations as required by the National Electrical Code, Section 410.4(A); ~~and~~**

**~~(2) Contains a ballast that is rated to operate at ambient air temperatures above 55° C, as specified by UL 1029.~~**

***Rationale: As discussed at the August 2005 meeting with CEC staff, the sections referenced in UL 1029 were intended for a stand-alone UL listed ballast, not for a ballast integral to a luminaire. Therefore exemption (2) is not appropriate.***

**Editorial Option 2**

(n) Luminaires

**"Exempted Outdoor Luminaire" means a luminaire certified by the manufacturer to the Commission as meeting all of the following criteria:**

**(1) Is rated for use in wet locations as required by the National Electrical Code, Section 410.4(A); ~~and~~ or**

**(2) Contains a ballast that is rated to operate at ambient air temperatures at or above 55° C, as specified by UL 1029.**

***Rationale:  This option allows CEC to maintain an ambient air temperature requirement if, in the future, ballasts integral to the luminaire are recognized for an ambient air temperature at or above* 55° C.**

**Standards for Metal Halide Luminaire**
Section 1605.3

(2) **Energy Efficiency Standard for Metal Halide Luminaires.** Metal halide luminaires, manufactured on or after the effective dates shown in Table N-1, shall meet the requirements shown in Table N-1.

Table N-1
Standards for Metal Halide Luminaires

| *Lamp Position* | *Lamp Rating* | *Effective Date* | *Requirements* |
|---|---|---|---|
| **Vertical (base-up)** | **150-500 Watts** | **Jan. 1, 2006** | **Luminaires shall not contain a probe-start metal halide ballast.** |
| **Vertical (~~all~~ ~~orientations~~ base-down)** | **150-500 Watts** | **Jan 1, 2008** | **Luminaires shall not contain a probe-start metal halide ballast.** |

**Notes: Fixtures are covered if they are capable of operating lamps that fall within the range of included lamp wattages. ~~Vertical includes both base-up and base-down products.~~ Vertical includes products rated for use within 15° of vertical.**

EXCEPTIONS:

1. Exempt outdoor luminaires.

Rationale: The 2008 requirements have been changed to a "vertical (base-down)" lamp position since the vertical base-up would already be regulated in 2006 and there are no other vertical burning positions.

The exemption is added to exempt outdoor luminaires as defined in 1602(n) because there are not sufficient luminaires available with non-probe start metal halide ballasts due to limited availability of vertical base-down or universal burning position pulse start lamps. We have previously requested data from CEC to verify that required evaluation of the technical feasibility has been done, and to supply studies relative to the demand generated by the regulation and cost effectiveness – specifically for outdoor lighting applications. To date, we have not been provided with these studies. Since there are not currently outdoor products available in vertical base down lamp position for some outdoor lighting applications, we find the implementation of this standard problematic because of lack of appropriate pulse start products. NEMA has also expressed concern regarding 175w probe start converting to 150w pulse start. While all four major lamp companies have a 150w pulse start lamps for universal burning positions, it has come to our attention that this lamp is largely available only with a medium base and is not suitable for replacement in outdoor luminaires. Only one manufacturer has a 150w mogul base that would

meet the requirements for outdoor luminaires. The matrix provided to CEC in July has been updated and included at the end of this document.

We support the evaluation of outdoor regulations using non-probe start ballasts in the future. However as we have stated in the past, we encourage CEC to address energy standards for MH luminaires in Title 24 building standards since this product category is used in applications where a building inspection is typically required. Also, typically if a single product, i.e. ballast, fails, the Title 20 requirements would not apply since the failed ballast component in the luminaire is typically replaced rather than the replacement of the entire luminaire – which is the covered product in Title 20.

Availability of Pulse Start Lamps:

| Lamp Wattage | Position | GE | OSI | Philips | Venture | NOTES |
|---|---|---|---|---|---|---|
| 150 | Vertical BU | | | | X | Universal burn available for Vertical Base Up, mogul base |
| | Vertical BD | | | | X | Universal burn available for Vertical Base Down, mogul base |
| | Horizontal | | | | X | Universal burn available for horizontal position, mogul base |
| | Universal (medium base) | X | X | X | X | These lamps would not be acceptable for outdoor products due to lamp base incompatibility |
| 175 | Vertical BU | X | X | X | X | |
| | Vertical BD | | | | | No vendors available for Vertical Base Down |
| | Horizontal | | | | | No vendors available for Horizontal |
| | Universal | | | | | |
| 200 | Vertical BU | | X | | X | Only two vendors for Vertical Base Up |
| | Vertical BD | | | | X | Only one vendor for Vertical Base Down |
| | Horizontal | | | | X | Only one vendor for Horizontal |
| | Universal | | | | | |
| 250 | Vertical BU | X | X | X | X | |
| | Vertical BD | | | | X | Only one vendor for Vertical Base Down |
| | Horizontal | | | | X | Only one vendor for Horizontal |
| | Universal | | | | | |
| 300 | Vertical BU | | | | X | Only one vendor for Vertical Base Up |
| | Vertical BD | | | | X | Only one vendor for Vertical Base Down |
| | Horizontal | | | | X | Only two vendors for Horizontal |
| | Universal | | | | | |
| 320 | Vertical BU | X | X | | X | |
| | Vertical BD | | | | X | Only two vendors for Vertical BD / Universal |
| | Horizontal | | X | | X | |
| | Universal | | | X | | |
| 350 | Vertical BU | X | X | X | X | |
| | Vertical BD | | | | X | Only one vendor for Vertical Base Down |
| | Horizontal | | | | X | Only one vendor for Horizontal |
| | Universal | | | | | |
| 400 | Vertical BU | X | X | X | X | |
| | Vertical BD | X | X | | X | |
| | Horizontal | | | X | X | Only two vendors for Horizontal |
| | Universal | | | | | |
| 450 | Vertical BU | | | | X | Only one vendor for Vertical Base Up |
| | Vertical BD | | | | X | Only one vendor for Vertical Base Down |
| | Horizontal | | | | | No vendors for Horizontal |
| | Universal | | | | | |

## III. Ballast Reporting

The NEMA Ballast members are resubmitting their comments of September 23, 2005 for consideration.

***On page 2, Section 1601 Scope Paragraph j.***

***Current Version:***

(j) Fluorescent lamp ballasts that are designed to:
(1) operate at nominal input voltages of 120 or 277 volts,
(2) operate with an input current frequency of 60 Hertz, and
(3) be used with T5, T8 or, T12 lamps.

***Proposed Version:***

(j) ***Federally-regulated*** fluorescent lamp ballasts that are designed to:
(1) operate at nominal input voltages of 120 or 277 volts,
(2) operate with an input current frequency of 60 Hertz, and
(3) be used with T12 lamps.

The purpose of this is to be consistent with the proposed text covering lamps, dishwashers, clothes washers, clothes dryers, cooking products and electric motors.

***On page 25, Section 1602 Definitions Paragraph j.***

***Current version***

The term 'F40T12 lamp' means a nominal 40W tubular fluorescent lamp which is 48 inches in length and one-and-a-half inches in diameter and conforms to ANSI standard C78.81- 2003 (Data Sheet 7881-ANSI-1010-1).

The term 'F96T12 lamp' means a nominal 75 watt tubular fluorescent lamp which is 96 inches in length and one-and-a-half inches in diameter, and conforms to ANSI standard C78.81-2003 (Data Sheet 7881-ANSI-3007-1).

The term 'F96T12HO lamp' means a nominal 110 watt tubular fluorescent lamp which is 96 inches in length and one-and-a-half inches in diameter, and conforms to ANSI standard C78.81-2003 (Data Sheet 7881-ANSI-1019-1).

***Proposed Version (Additions in Bold)***

**F40T12 Lamp:** The term 'F40T12 lamp' means a nominal 40W tubular fluorescent lamp which is 48 inches in length and one-and-a-half inches in diameter and conforms to ANSI standard C78.81- 2003 (Data Sheet 7881-ANSI-1010-1).

**F34T12 Lamp: The term 'F34T12 lamp' (also known as a 'F40T12/ES lamp') means a nominal 34W tubular fluorescent lamp which is 48 inches in length and a one-and-a-half**

**inches in diameter and conforms to ANSI standard C78.81-2003 (Data Sheet 7881-ANSI-1006-1).**

**F96T12 Lamp:** The term 'F96T12 lamp' means a nominal 75 watt tubular fluorescent lamp which is 96 inches in length and one-and-a-half inches in diameter, and conforms to ANSI standard C78.81-2003 (Data Sheet 7881-ANSI-3007-1).

**F96T12 Energy Saving Lamp: The term 'F96T12 energy saving lamp' means a nominal 60 watt tubular fluorescent lamp which is 96 inches in length and one-and-a-half inches in diameter, and conforms to ANSI standard C78.81-2003 (Data Sheet 7881-ANSI-3006-1).**

**F96T12HO Lamp:** The term 'F96T12HO lamp' means a nominal 110 watt tubular fluorescent lamp which is 96 inches in length and one-and-a-half inches in diameter, and conforms to ANSI standard C78.81-2003 (Data Sheet 7881-ANSI-1019-1).

**F96T12HO Energy Saving Lamp: The term 'F96T12HO energy saving lamp' means a nominal 95 watt tubular fluorescent lamp which is 96 inches in length and one-and-a-half inches in diameter, and conforms to ANSI standard C78.81-2003 (Data Sheet 7881-ANSI-1017-1).**

This helps to clarify the actually federally covered lamps by defining their energy savings counterparts.

**Section 1606 Filing by Manufacturers; Listing of Appliances in Database**
**Table V Data Submittal Requirements, Section J**

***Current Version***

| | *Appliance* | *Required Information* | *Permissible Answers* |
|---|---|---|---|
| J | Fluorescent Lamp Ballasts | *Ballast Input Voltage | 120, 277 |
| | | *Number of Lamps | |
| | | *Type of Lamp | F40T12, F96T12, F96T12HO, other T12 (specify), T5, T8, other (specify) |
| | | Designed for Dimming | Continuous, stepped, no |
| | | Designed for Dimming to 50% or Less of Maximum Output | Continuous, stepped, no |
| | | Power Factor | |
| | | Building Application | Designed but not labeled for use only in residential buildings, designed and labeled for use only in residential buildings, other |
| | | Designed for Use in Ambient Temperatures of ≤ 0° F | Yes, no |
| | | Designed for Use (a) at Ambient Temperatures ≤ -20° F and (b) in an Outdoor Sign (for models with two F96T12HO lamps only) | Yes, no |
| | | Replacement Ballast as Defined in Section 1602(j) | Yes, no |
| | | Total Nominal Lamp Watts | |
| | | Ballast Efficacy Factor | |
| | | Relative Light Output | |
| | | Circuit Design | Cathode cut-out, electronic, magnetic |
| | | Start | Instant, rapid |

***Proposed Version (Additions in bold)***

| | *Appliance* | *Required Information* | *Permissible Answers* |
|---|---|---|---|
| J | **Federally-regulated** Fluorescent Lamp Ballasts | *Ballast Input Voltage | 120, 277 |
| | | *Number of Lamps | |
| | | *Type of Lamp | F40T12**, F34T12**, F96T12, **F96T12/ES**, F96T12HO, **F96T12HO/ES** |
| | | Designed for Dimming | Continuous, stepped, no |
| | | Designed for Dimming to 50% or Less of Maximum Output | Continuous, stepped, no |
| | | Power Factor | |
| | | Building Application | Designed but not labeled for use only in residential buildings, designed and labeled for use only in residential buildings, other |
| | | Designed for Use in Ambient Temperatures of ≤ 0° F | Yes, no |
| | | Designed for Use (a) at Ambient Temperatures ≤ -20° F and (b) in an Outdoor Sign (for models with two F96T12HO lamps only) | Yes, no |
| | | Replacement Ballast as Defined in Section 1602(j) | Yes, no |
| | | Total Nominal Lamp Watts | |
| | | Ballast Efficacy Factor | |
| | | Relative Light Output | |
| | | Circuit Design | Cathode cut-out, electronic, magnetic |
| | | Start | Instant, rapid |

[End of NEMA Comments on 15-day language dated September 30, 2005]